Teacher Guide

RewriteClimate
Core programme

rewriteclimate

Rewrite Climate

Teacher Guide: Core Programme

Welcome to RewriteClimate, a programme that has been specially designed for students in transition year and tested by TY students, TY co-ordinators and teachers from a range of disciplines such as physics, chemistry, geography, sustainability and more.

The purpose of this guide is to give you an overview of the course and to provide you with a series of offline assignments which can be used alongside the online material. You are free to use (or not use) them as you like.

RewriteClimate is brought to you by Cool Planet Experience — the world's first ever climate change visitor experience, based in Powerscourt, County Wicklow. We've been working with schools and educators since we opened our doors in March 2018. Any questions, please get in touch. We're always happy to chat.

Ultimately our goal is for you and your students to complete this programme and feel inspired, hopeful and positive about their future. There's a lot to be excited about!

Thank you from the RewriteClimate Team

Contents

“RewriteClimate is delivered in an interactive way that is really appealing to TY students. The videos and stories really capture students’ attention. ”

RewriteClimate
The Structure:

As you can see online, the core programme consists of five lessons:

1. **Carbon**
2. **Climate Change**
3. **Taking Action**
4. **Energy (2 class periods)**
5. **Fashion**

The lessons should be completed in this order. Most lessons can be completed over one class period (on the assumption that the average class length is between 45–60 minutes long). The exception to this rule is the lesson on Energy, which we recommend splitting over two class periods.

"Absolutely amazing. Perfect amount of reading and interactivity whilst keeping the course engaging and entertaining!"

The programme is flexible in terms of the amount of time you take to go through the lessons — it could be completed in a day, a week or several weeks. You are free to spread it out as you wish. Whenever they complete all the lessons, students will have to complete a short test in order to receive a certificate.

Each lesson is broken down into sections and contains video, infographics, short quizzes and clear, relatable explanations. Some of the content is marked as optional; students are free to explore this if they are interested but they don't have to.

Curriculum links are available on request. RewriteClimate covers the following senior cycle subjects; Physics, Chemistry, Biology, Ag Science, Home Economics, Economics, Business Studies, Geography, Politics & Society.

Now, let's take a look at the lessons in more detail.

The lessons

Carbon

Lesson one
Carbon:

The element carbon is a key part of life on Earth. Plants are half carbon. You are almost 20% carbon! But in the last 200 years we've seen rising levels of carbon dioxide (and other greenhouse gases). Where does carbon dioxide come from? And what happens when there's too much of it in the atmosphere?

The answers to all these questions can be found in the carbon cycle. In this lesson we'll show how the carbon cycle relates to the two big drivers of climate change: the Greenhouse Effect (and consequently Global Warming) and Ocean Acidification.

By engaging in this lesson, students are learning to:

- **Explain the natural carbon cycle;**
- **Describe the greenhouse effect and how it impacts global warming;**
- **Analyze the relationship between human activity and the carbon cycle.**

This lesson is divided into 4 sections:

1. **Section 1:** What is Carbon?
2. **Section 2:** The Carbon Cycle…in Balance
3. **Section 3:** The Carbon Cycle….Out of Balance
4. **Section 4:** Carbon Footprints
5. **Recap quiz**

Climate change

Lesson two
Climate change:

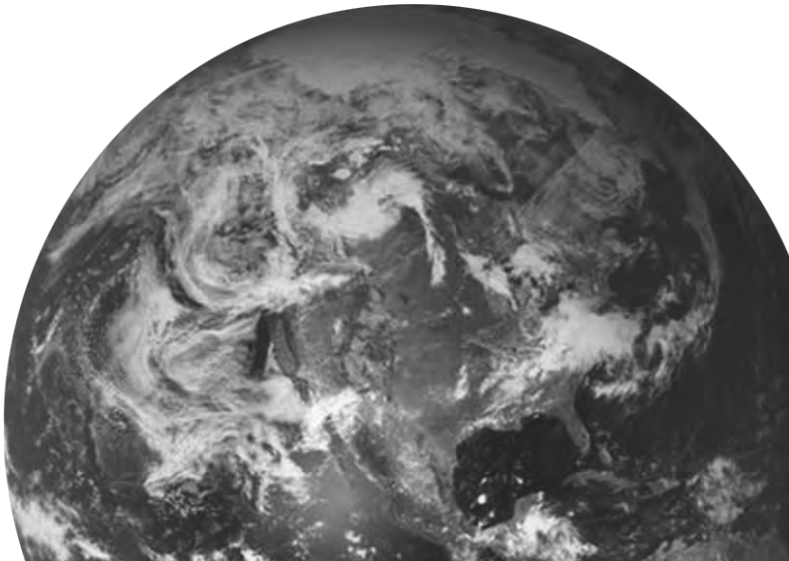
So now we know what causes climate change, it's time to look at what climate change actually *is*. For this we start from the basics: What is climate? How is it different from weather? And why is it a problem for humans and the Earth's biodiversity when it changes?

After completing this lesson, students will be able to:

- **Explain the difference between weather and climate;**
- **Describe the climate system and the causes of climate change;**
- **Identify the effect of climate change on our planet.**

This lesson is divided into four sections:

1. **Section 1:** What is Climate?
2. **Section 2:** What is Climate Change?
3. **Section 3:** What are the Effects of Climate Change?
4. **Section 4:** What Can I do?
5. **Recap quiz**



Taking

Lesson three
Taking action:

Okay, so climate change is a problem and we know what causes it. Let's do something about it! In this lesson we look at the movers and shakers of the world. We've all heard of Greta Thunberg but who else is making a difference? This lesson takes you through the different levels of change — from international cooperation down to local and personal action and activism.

By engaging in this lesson, students will be able to:

- **Explain the different types of climate action and take inspiration from some activists and groups making a difference;**
- **Describe how governments are incorporating climate action into policy;**
- **Recognise climate deniers and question sceptics;**
- **Know what positive climate actions they can take.**

This lesson is divided into three sections:

1. **Section 1:** Introduction to Taking Action
2. **Section 2:** Climate Action
3. **Section 3:** Climate Activism
4. **Recap quiz**

action

Ener  gy

Lesson four & five
Energy

Energy is the driving force behind everything on the planet: cars, lights, phones, PlayStations, you, me, all humans and, unfortunately, climate change. In this lesson, students will explore the relationship between energy and climate and understand how we are at the cusp of the biggest energy transition in history.

By engaging in this lesson, students will be able to:

- **Illustrate the different types of energy, and the relationship between energy and climate change;**
- **Explain the solutions that exist to move from a high carbon form of energy to one that is renewable;**
- **Explore the exciting opportunities and innovations that can change how we get our energy;**
- **Know what they can do to make changes in their life.**

This lesson is divided into five sections:

1. **Section 1:** What is Energy?
2. **Section 2:** The Different Types of Energy
3. **Recap quiz 1**
4. **Section 3:** The Problem — Fossil Fuels
5. **Recap quiz 2**
6. **Section 4:** The Solution — Renewables
7. **Section 5:** What Can I Do?

We predict that Energy will need to be split over two lessons. You are free to divide it up as you see fit but a natural break point would be after Section 3.

Fashion

Bonus Lesson
Fashion

Whether you follow the latest trends or not, fashion plays a role in all of our lives. And it accounts for 10% of all global carbon emissions. This makes it a key (and often under-appreciated) part of our own carbon footprints. In this lesson students will learn about the negative effects of clothes production and the new exciting innovations that are already changing this industry for the better.

By engaging in this lesson, students will be able to:

- **Explore and explain the negative relationship between fashion production and climate change;**
- **Explore innovations and market trends that will reduce fashion's carbon footprint;**
- **Know about sustainable habits they can adopt for buying and using fashion items.**

This lesson is divided into five sections:

1. **Section 1:** What does Fashion have to do with Climate Change?
2. **Section 2:** Fashion — Problems
3. **Section 3:** Fashion — Solutions
4. **Recap quiz**
5. **Section 4:** What Can I Do?
6. **Final Core recap quiz**

Offline assignments

Core programme:

Here we've included a range of assignments that complement the online programme. Depending on the assignment and your needs, your students can do them in the classroom, as homework, in groups or as an individual activity.

Also, if you have any other assignment ideas that you would like to share, we would love to know!

01

Carbon

Assignment 1

Think like an engineer!

Engineers are working to rebalance the carbon cycle by reducing CO_2 emissions or even reducing the amount of CO_2 already in the atmosphere. For example, environmental engineers are studying how to remove carbon from the atmosphere, and mechanical and electrical engineers are working to design buildings, homes, cars and appliances that use less energy. Engineers are also working to create technologies to capture and store carbon found in forests, oceans and soils.

- **Have the students work in pairs to brainstorm a new invention that would help reduce carbon emissions into the atmosphere by reducing the energy used by people during an everyday activity (such as washing clothes, cooking a meal or driving a car). For this exercise, imagine that there is an unlimited budget — encourage students to think big!**

02

Climate change

Assignment 2a

Film club

A

Choose a climate documentary from this list (or choose your own). Your students can watch it at home or you can watch it together in class. You can discuss any aspects of the film you choose but here are a few discussion ideas to get you started:

- **How did you feel after watching this movie?**
- **What were you really surprised by?**
- **Did you understand the solutions discussed / how to fix the problems addressed in the movie?**
- **How important is research and analysis in understanding the nature of climate change?**
- **How important is science in reversing climate change?**
- **How important is technology in reversing climate change?**
- **If you wanted to be a part of the solution — how do you think you could do this? Could you even make it as a career?**

02

B

Climate change

Assignment 2b

A report on the impact of climate change in Ireland

Over the next few decades, the Earth will warm by at least 1.5 degrees. No country will be left unscathed by this. What impact will this have on Ireland?

Define the climatic changes expected in Ireland over the next decades in clear terms. When doing your research look into things like:

- **Precipitation changes (rainfall, snow, storms)**
- **Temperature changes**
- **Sea Level Rise and Flooding**
- **Drought**

They should answer these key questions with regards to the area of research:

- **Describe the changes that have happened already and the risk for the future.**
- **How will these changes and risks impact Ireland (think about people, animals, landscapes)?**
- **Who will be impacted the most by it (chances are not everyone will be affected equally)?**
- **What is being done to address the risk of harm?**
- **If nothing is being done, what could be done?**

If students want to go one step further they could write an email to their local TD or County Councillor outlining the risks they have found and the actions that politicians should be taking —it's very likely the students will know more about the topic than the politician!

03

Taking action

Assignment 3a

Get creative in the best way you know how!

Create a video, mini radio programme, cartoon strip, rap, story, song, poster or even a dance to communicate climate change. Ask your students the following:

1. **What aspect of climate change will you communicate?**
2. **Who do you want to target and why would they care?**
3. **Can they help to change the status quo?**

Whatever medium your students choose, here's some tips for them:

- **Decide on a story or message to convey**
- **Set the scene, paint a picture with words or gestures**
- **Look for the meaning: what is the purpose?**
- **Make it engaging: Who is your target audience? What do they care about?**
- **Keep it hopeful: think about the tone of your message**
- **Keep it brief!**
- **Add a call to action — ask your audience to do something.**

You could simplify further by giving all groups (or individuals) the same aspect of climate change to talk about, the same points to include or the same target audience, then leave them to be creative in whatever method they choose. Or you could give each group a different target audience and let them choose the medium and subject that's best to reach them

03

B

Taking action

Assignment 3b

Investigative journalism — 'You can't handle the truth'

In this assignment, students will take on the role of an investigative journalist and write a news story on the impacts of climate change in a developing country that's particularly vulnerable to climate change. They could choose their own or choose one of:

- **Mozambique, Zimbabwe, Bahamas, Rwanda, Puerto Rico, Myanmar, Haiti, Pakistan, Philippines, Fiji, the Pacific Island States.**

Students should take the time to dig up all the facts, collate and analyse the differing viewpoints, fact check and reference their sources. They should also think about the most persuasive way to tell their story.

Their story should cover the following points (although it doesn't have to be in this order):

1. **Set the scene: choose a few key relevant facts about the country. For example: its environment and topology, its people, their livelihoods or the national GDP.**
2. **What is happening in the region as a result of climate change? Research the knock-on effects in the local environment and communities and the challenges they face.**
3. **How does their story relate to climate justice? (For starters, you might want to look at the carbon footprint of the country itself.)**
4. **What can we do to help?**
5. **Bonus: first-hand quotes from people living in the country.**

03

Taking action

Assignment 3c

Build awareness on something close to your heart — Blogging and social

An easier version of the previous assignment, students should write a blog on an aspect of climate change that interests them. Blogs are short articles that are posted on different websites: they are used on social media or email to drive engagement and get folks to read them. The more people that read and share the better!

What makes a good blog:

1. **A strong title**
2. **A powerful image (or images)**
3. **Short uncomplicated sentences**
4. **Interesting topics**

Some other things to consider:

- **Could students get their blog hosted? Is it possible to publish it on your school's website?**
- **A possible extension would be to create associated social media posts for the blog post. Being able to craft engaging sentences for the posts and find suitable imagery (or video) is a skill in itself.**

04

A

Energy 1

Assignment 4a

Peer learning with Energy Types

There are 9 energy types (mechanical, thermal gravitational, sound, electric, electromagnetic, elastic, chemical and nuclear). Break up the class into small groups. Each group takes a different energy type to research. In your next class each group can share what they have learned with the rest of the class.

The presentations should be no more than 5 minutes long and one speaker per group. Students need to explain:

- **What is it?**
- **Is it Potential or Kinetic?**
- **Where does it come from?**
- **What are examples of this type of energy in everyday life?**
- **How does this energy appear in the natural world?**
- **Is this energy currently harnessed and used for electricity/heating?**
- **Can you think of any new opportunities or innovations for how this type of energy could be harnessed in a sustainable manner? (It doesn't have to be feasible!)**
- **What are the major drawbacks of using this kind of energy?**

04

B

Energy 1

Assignment 4b

Let's talk about energy — It's everywhere!

Divide your class up into mini groups of (about 3–5 in each group). Identify:

- **One person to take notes with a helper.**
- **One person to be the spokesperson**
- **Everyone must be heard — take turns and allow everyone to share their point of view.**

Discussion topics:

1. **Energy blackouts are common in some countries and in remote communities. They have serious consequences on people's lives and livelihoods. Imagine we had an energy blackout for 24 hours. What would the knock-on effects be? Students should list as many problems as they can think of in 5 minutes, the less obvious the better.***
2. **80% of our energy still comes from fossil fuels. What are the main reasons why this is still he case? Discuss how you, your families and our governments can stop this.**

**n.b. You could play scattergories with the answers. Each group takes it in turns to read out a consequence. It's worth 10 points if no other group has the same one written down; 5 points if one other group does; 3 points if 2 others do; 1 point otherwise.*

05

A

Energy 2

Assignment 5a

Entrepreneurs in Energy — spread the world and help them advertise for change

Pick an entrepreneur in energy. It can be one of the entrepreneurs we talked about in the last part of the programme or students can choose their own.

Students should create an advertisement for their product or service. They should consider the following influencing factors:

- **The target audience: who would be mostly likely to buy it?**
- **The channel: where is the most suitable place to put the ad and when? What type of media does the audience engage with? E.g. TV, radio, newspapers, billboards, social media channels.**
- **The message: what information do you need to include in your ad? What does a potential customer really need to know about the product? Less is more.**
- **A slogan: what would be a really memorable headline be for your advert? Short is definitely better!**

Students could just describe their ad or they could mock it up through drawings. They might want to think about how the ad could become a campaign. How would it change when its displayed in different channels? For example, how would a radio ad become a big billboard ad or a newspaper ad?

05

B

Energy 2

Assignment 5b

Renewable microgeneration investigation

Currently most of the electricity generated in Ireland is produced in large power stations from fossil fuels such as gas, coal, peat, and oil. But as renewable energies become cheaper, many households and small businesses are considering installing micro-generation. This involves installing a small generator powered by a renewable energy source such as wind, solar or hydro power or biomass — so great news!

Ask your students to investigate microgeneration. This should include:

- **Making a list of the main benefits**
- **Devising a plan for your school, your home or even an important local public building within your community to install microgeneration.**

When deciding which is the right solution, students might be influenced by factors such as:

- **Availability and reliability of renewable energy sources**
- **Suitability of the site for chosen renewable technology — why is it going to work for this building?**
- **The look of the equipment on the building**
- **Cost of equipment and installation?**
- **How might you fund this project?**

05

Energy 2

Assignment 5c

Energy zapping audit — reduce waste, save money

Whenever you leave an appliance on standby rather than switching it off at the plug, it continues to drain energy. Standby power is the energy used by an electrical device (or a power adapter) when it is turned off but still plugged into a power source. It's a complete waste of energy. Research tells us that between 9–16% of the electricity consumed in homes is used to power appliances when they are in this standby mode.

In this assignment students will understand how to prevent unnecessary energy waste and save money.

If you were doing it at school you could divide the class into groups and then divide the school into the same number of areas. Give each group an individual area within the school to investigate and do an "energy-zapping" audit.

As part of this students could :

- **Find out how many electrical products are being left on or on standby when not in use. Include every appliance in the school: photocopiers, projectors, computers, heaters, ovens, interactive whiteboards, toasters etc.**
- **Document / make a list of each product, its quantity and location and status (being left on / being turned off)**
- **Create labels to remind people to turn them off / unplug them.**
- **Interview relevant staff members to find out / make a distinction between appliances that have to be kept on (security cameras etc) versus ones that are left on for convenience.**
- **Calculate the energy wastage from the devices that are being left on or on standby, both in euros and CO_2 emissions**

06

A

Fashion

Assignment 6a

Host a fashion show

Host a fashion show with only:

- **borrowed**
- **swapped**
- **recycled**
- **upcycled**
- **vintage or second hand clothes**

The objective of this assignment is for students to demonstrate that they can still look and feel fashionable without having to buy, buy, buy SO many new clothes. It can also be a fun and creative way to show off their own individuality, personality and style.

As part of the fashion show, students should talk about where the clothes come from. This could include telling the stories behind the funky heirlooms or shouting out to the best websites, apps and shops to purchase secondhand clothes from.

The assignment relates to the wider issue of how we can change our purchasing habits and avoid being sucked into the fast fashion machine. The world is full of clothes that can be repaired, reused and upcycled. Let's show how!

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